

1 **CLAIMS**

2 What is claimed is:

3 1. A method for mapping between parts of an input document and associated parts  
4 of an output document, the input document pertaining to a first kind of document, and the  
5 output document pertaining to a second kind of document, comprising:

6 providing a translation file that converts documents of the first kind to documents  
7 of the second kind;

8 in a first phase, modifying the translation file to include mapping functionality  
9 that can provide information regarding relationships between parts of documents of the  
10 first kind and associated parts of documents of the second kind, the first phase producing  
11 a modified translation file;

12 in a second phase, using the modified translation file to convert the input  
13 document into the output document, including:

14 activating the mapping functionality; and

15 using the mapping functionality to provide references in the output  
16 document that associate parts of the output document with parts of the input  
17 document.

18  
19 2. The method according to claim 1, where the first kind of document is a markup  
20 language document that uses tags pertaining to subject matter fields in the input  
21 document.

22  
23 3. The method according to claim 2, wherein the first kind of document is  
24 expressed in the extensible markup language (XML).  
25

1           4. The method according to claim 1, wherein the second kind of document is a  
2 markup language document that uses tags pertaining to visual features in the output  
3 document.

4  
5           5. The method according to claim 4, wherein the second kind of document is  
6 expressed in hypertext markup language (HTML).

7  
8           6. The method according to claim 1, wherein the output document comprises an  
9 electronic form having at least one data entry field therein, wherein the data entry field is  
10 mapped to a corresponding part of the input document via at least one reference.

11  
12          7. The method according to claim 6, further comprising:  
13 receiving information input by a user into the data entry field; and  
14 modifying the corresponding part of the input document pointed to by the at least  
15 one reference in response to the receiving.

16  
17          8. The method according to claim 1, wherein the translation file is expressed in  
18 the extensible stylesheet language (XSL).

19  
20          9. The method according to claim 8, wherein the modifying of the translation file  
21 includes adding extension functions to the translation file expressed in the extensible  
22 stylesheet language (XSL).

1           10. The method according to claim 9, wherein the activating of the mapping  
2 functionality includes calling the extension functions to return the references that  
3 associate parts of the output document with parts of the input document.

4  
5           11. The method according to claim 1, wherein the modifying of the translation file  
6 in the first phase includes adding the mapping functionality at locations in the translation  
7 file that mark context changes in the output document.

8  
9           12. The method according to claim 1, wherein the modifying of the translation file  
10 in the first phase includes adding the mapping functionality at locations in the translation  
11 file that mark data items contained in the input document that are to be bound to  
12 corresponding parts in the output document.

13  
14           13. An apparatus including logic configured to implement the modifying and  
15 using recited in claim 1.

16  
17           14. A computer readable medium having machine readable instructions for  
18 implementing the modifying and using recited in claim 1.

19  
20           15. A method for generating mapping functionality that can map between parts of  
21 an input document and associated parts of an output document, the input document  
22 pertaining to a first kind of document, and the output document pertaining to a second  
23 kind of document, comprising:

24           providing a translation file that converts documents of the first kind to documents  
25 of the second kind; and

1           modifying the translation file to include mapping functionality that can provide  
2 information regarding relationships between parts of documents of the first kind and  
3 associated parts of documents of the second kind.

4  
5           16. A method of editing an electronic form, comprising:  
6           displaying an electronic form on a display device using a presentation markup  
7 language;  
8           receiving data entered into part of the electronic form;  
9           mapping the part of the electronic form that received the data to an associated part  
10 of an XML data file corresponding to the electronic form;  
11           modifying the associated part of the XML data file; and  
12           updating the display device of the electronic form to reflect the entering of data.

13  
14           17. An apparatus for mapping between parts of an input document and associated  
15 parts of an output document, the input document pertaining to a first kind of document,  
16 and the output document pertaining to a second kind of document, and further wherein a  
17 translation file converts documents of the first kind to documents of the second kind, the  
18 apparatus comprising:

19           annotation logic configured to modify the translation file to include mapping  
20 functionality that can provide information regarding relationships between parts of  
21 documents of the first kind and associated parts of documents of the second kind, to  
22 thereby provide a modified translation file;

23           a storage for receiving the modified translation file;

24           runtime logic configured to convert the input document into the output document  
25 using the modified translation file in the storage, including:

1                   activation logic configured to activate the mapping functionality; and  
2                   output logic configured to use the activated mapping functionality to  
3                   provide references in the output document that associate parts of the output  
4                   document with parts of the input document.

5  
6                   18. The apparatus according to claim 17, where the first kind of document is a  
7                   markup language document that uses tags pertaining to subject matter fields in the input  
8                   document.

9  
10                  19. The apparatus according to claim 18, wherein the first kind of document is  
11                  expressed in the extensible markup language (XML).

12  
13                  20. The apparatus according to claim 17, wherein the second kind of document is  
14                  a markup language document that uses tags pertaining to visual features in the output  
15                  document.

16  
17                  21. The apparatus according to claim 20, wherein the second kind of document is  
18                  expressed in hypertext markup language (HTML).

19  
20                  22. The apparatus according to claim 17, wherein the output document comprises  
21                  an electronic form having at least one data entry field therein, wherein the data entry field  
22                  is mapped to a corresponding part of the input document via at least one reference.

23  
24                  23. The apparatus according to claim 22, further comprising:  
25

1 receiving logic configured to receive information input by a data into the user  
2 entry field; and  
3 editing logic configured to modify the corresponding part of the input document  
4 pointed to by the at least one reference in response to the receiving.

5  
6 24. The apparatus according to claim 17, wherein the translation file is expressed  
7 in the extensible stylesheet language (XSL).

8  
9 25. The apparatus according to claim 24, wherein the annotation logic is  
10 configured to modify the translation file by adding extension functions to the translation  
11 file expressed in the extensible stylesheet language (XSL).

12  
13 26. The apparatus according to claim 25, wherein the activation logic is  
14 configured to activate the mapping functionality by calling the extension functions to  
15 return the references that associate parts of the output document with parts of the input  
16 document.

17  
18 27. The apparatus according to claim 17, wherein the annotation logic is  
19 configured to modify the translation file in the first phase by adding the mapping  
20 functionality at locations in the translation file that mark context changes in the output  
21 document.

22  
23 28. The apparatus according to claim 17, wherein the annotation logic is  
24 configured to modify the translation file in the first phase by adding the mapping  
25

1 functionality at locations in the translation file that mark data contained in the input  
2 document that are to be bound to corresponding parts in the output document.

3  
4 29. A computer readable medium having machine readable instructions for  
5 implementing each of the logic recited in claim 17.

6  
7 30. An apparatus for providing mapping functionality that maps between parts of  
8 an input document and associated parts of an output document, the input document  
9 pertaining to a first kind of document, and the output document pertaining to a second  
10 kind of document, and further wherein a translation file converts documents of the first  
11 kind to documents of the second kind, the apparatus comprising:

12 annotation logic configured to modify the translation file to include mapping  
13 functionality that can provide information regarding relationships between parts of  
14 documents of the first kind and associated parts of documents of the second kind; and  
15 a storage for receiving the modified translation file.

16  
17 31. A computer readable medium having stored thereon an information structure,  
18 comprising:

19 a plurality of translation elements configured to convert a first kind of document  
20 into a second kind of document; and

21 a plurality of functions interspersed amongst the plurality of translation elements,  
22 the plurality functions configured to provide a respective plurality of references, wherein  
23 the references provide pointers that link parts of the second kind of document with parts  
24 of the first kind of document.

1           32. The computer readable medium of claim 31, wherein a collection of the  
2 plurality of functions have respective positions amongst the plurality of translation  
3 elements so as to mark context changes in the second kind of document.

4  
5           33. The computer readable medium of claim 31, wherein a collection of the  
6 plurality of functions have respective positions amongst the plurality of translation  
7 elements so as to mark data contained in the first kind of document that is to be bound  
8 with corresponding parts in the second kind of document.

9  
10          34. A computer readable medium having stored thereon an information structure,  
11 comprising:

12           a plurality of translation elements configured to convert a first kind of document  
13 into a second kind of document; and

14           a plurality of references interspersed amongst the plurality of translation elements,  
15 wherein the plurality of references provide pointers that link respective parts of the  
16 second kind of document with parts of the first kind of document.

17  
18          35. The computer readable medium of claim 34, wherein a collection of the  
19 plurality of references have respective positions amongst the plurality of translation  
20 elements so as to mark context changes in the second kind of document.

21  
22          36. The computer readable medium of claim 34, wherein a collection of the  
23 plurality of references have respective positions amongst the plurality of translation  
24 elements so as to mark data contained in the first kind of document that is to be bound  
25 with corresponding parts in the second kind of document.

1  
2 37. A computer readable medium having stored thereon an information structure,  
3 comprising:

4 a plurality of presentation elements expressed in a markup language configured to  
5 enable visual presentation of an electronic form; and

6 a plurality of references interspersed amongst the plurality of presentation  
7 elements, wherein the plurality of references provide pointers that link parts of the  
8 electronic form to respective parts of a structured data file on which the electronic form is  
9 based.  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25